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Immediate Action or a Flop?

Ever since it was launched in 1902, the FOUNDRY TRADE JOURNAL has been a forum for the expression of current opinions on the training of foundry lads. A study of these reveals that the employers' point of view has never varied and can be summarised as follows:—(1) The sole place for the teaching of the craft of moulding was the foundry floor. (2) Before the moulder could be called thoroughly skilled he needed experience in lines not normally made in the shop where his apprenticeship was served. (3) The average boy needed some training in citizenship to instil into him a proper outlook on life. On other aspects there has been a divergency of views, but on these there was at least unanimity. The whole problem was rationalised by the Meehanite group of foundries, by the establishment of a training centre, to which the lads employed by the group go several times for monthly periods during their training. Since the teething troubles were overcome, the scheme has been an unqualified success and to-day there is a waiting list.

This scheme was examined most thoroughly by a Committee of the Council of Ironfoundry Associations and as a result there was established in the form of a Report a somewhat similar plan to be operated on a regional basis. This Report has been discussed by the various areas and has been enthusiastically endorsed. Only in one case, however, has action been taken; a training centre has been in operation at Swan Village for about six months. It had an excellent "send-off." There was a full complement of lads and at the completion of their period they were so enthusiastic as to the conditions they experienced that they clubbed together and presented their instructor with a silver cigarette case. Then, most unfortunately, the instructor died, but a new appointment has been made. It is most disappointing now to relate that a steady stream of boys is not coming along, despite the fact that the Midland ironfounders *have been kind enough to make the Centre available to the whole country*. We are fully cognisant of the ease with which any new educational movement can be started because of the reservoir which, through neglect, has been accumulated. We are also well aware of the difficulties of maintaining the initial interest, but surely in this case, with a thousand foundries in the Midlands and a further 4,000 throughout the land, it must be sheer inertia on the part of the employers that is causing the hold-up. We ask every employer of boys throughout the land to look round his shops to see if young Jones, Smith or Brown would not benefit by participating in the scheme, because, if Jones, Smith or Brown would benefit, so would the firm. We do not accept the dictum that the standard of education is so low that Jones, Smith and Brown could not benefit from participation. The course is so practical that the boys will return with a new outlook on their job.

In the interests of the industry, be it ferrous or non-ferrous, our advice must be followed—and that quite quickly—if a most serious setback is not to be experienced. The importance of this is stressed by the fact that a number of other centres are waiting to see the results of this experiment, though why this should be the case is something of a puzzle, because in truth it is not experimental, as the undoubted success of the Meehanite effort has well shown. The areas are acting unwisely in this *laissez faire* attitude, as the major foundry regions are quite large enough to support with success their own centres. Primarily, however, the scheme already launched must be made a success, so we ask employers to sit down and write to Mr. R. Forbes Baird, 117, Church Lane, Handsworth Wood, Birmingham, 20, for details of the scheme.

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Death of Mr. G. T. Lunt

The death has occurred of Mr. G. T. Lunt, managing director of Bradley & Foster, Limited, of Darlaston, at the age of 60. Mr. Lunt was a man who had more than average faith in technology as a cardinal factor in the conduct of business. When Dr. J. E. Hurst joined him as an associate, his firm became the centre of much valuable research work. It was only natural that Mr. Lunt should take a close interest in the organisation on a national basis of technical and research activities associated with the industry. He joined the Institute of British Foundrymen in 1928 and served for many years on the Council. He was a past president of the Birmingham Branch. For several years he has been honorary treasurer of the British Cast Iron Research Association. Other activities included the chairmanship of the Cylinder and Refined Iron Association, membership of the Iron and Steel Institute, of the Staffordshire Iron and Steel Institute, and of the executive of the Joint Iron Council. He was a Freeman of the City of London through his association with the Livery of the Worshipful Company of Founders.

Capper Pass Awards

In 1947, the Directors of Capper Pass and Son, Limited, Bristol, sharing the regret which had been expressed in many quarters at the dearth of papers on processes and plant used in extraction metallurgy in the *Transactions of the Institution of Mining and Metallurgy*, and of papers on processes and plant used in the fabrication of non-ferrous metals in the *Journal of the Institute of Metals*, offered to these Institutions the sum of £200 per annum for a period of 7 years to be applied as follows:—

(*a*) £100 per annum to be available for one or more awards to the authors of papers on some aspects of non-ferrous extraction metallurgy;

(*b*) £100 per annum to be available for one or more awards to the authors of papers relating to some process or plant used in the extraction or fabrication of non-ferrous metals,

contributed by persons engaged full time in industry or practice.

The Councils of the two bodies hope that the generous offer made by Capper Pass and Son, Limited, will stimulate the writing of many papers of the types for which the awards are to be made. Papers on extraction metallurgy should preferably be submitted to the Institution of Mining and Metallurgy, while those on processes and plant used in the fabrication of non-ferrous metals should preferably be offered to the Institute of Metals. Both societies are prepared to accept papers of suitable quality from non-members. All papers published annually by both societies will be examined by the Committee, and notices of the awards will be published in the journals of the two societies and in the Press. The Committee will shortly consider all papers published by the two societies during 1948.

Forthcoming Events

(Secretaries are invited to send in notices of meetings, etc., for inclusion in this column.)

JANUARY 17.

Institution of Production Engineers

Halifax Section:—"Electronics in Industry," by L. G. Ward, B.Sc., at the White Swan Hotel, Halifax, at 7.0 p.m.

North Eastern Section:—"Some Measurements of British and American Industrial Efficiency," by L. C. Ord, at the Neville Hall, Newcastle-upon-Tyne, at 6.30 p.m.

JANUARY 18.

Coventry Graduate Section:—"Powder Metallurgy," by A. Carter, in Room A5, the Technical College, Coventry, at 7.15 p.m.

JANUARY 19.

Liverpool Section:—"Metals in the Service of Man," by Dr. Alexander, at Radiant House, Bold Street, Liverpool, at 7.15 p.m.

Manchester Metallurgical Society.

"Metallography of Stainless and Heat-resisting Steels," by J. I. Morley, A.Met., at the Engineers' Club, Albert Square, Manchester, at 6.30 p.m.

Institute of Vitreous Enamellers

Northern Section:—Supper at the Queen's Hotel, Manchester, at 8 p.m.

Institute of Welding

North London Branch:—Presidential Address, at the Polytechnic, Regent Street, London, W.1, at 7.30 p.m.

JANUARY 21.

Brighouse Engineering Society.

"Some Aspects of Works Maintenance," by H. E. Apps, at the Gas Lecture Room, Park Street, Brighouse, at 7.30 p.m.

Institute of British Foundrymen.

Falkirk Section:—"Core-shop Practice," by A. L. Mortimer, in the Smoke Room, Temperance Café, Lint Riggs, Falkirk, at 7.0 p.m.

The Institute of Metals.

Sheffield Local Section:—"Thermocouples," by R. C. Jewell, B.Sc., at the Grand Hotel, Sheffield, at 6.30 p.m.

JANUARY 22.

Institute of British Foundrymen.

Bristol and West of England Branch:—"Loam Moulding," by W. H. Hornby, at the Grand Hotel, Broad Street, Bristol, at 3.0 p.m.

Burnley Section:—"A Day in the Foundry," by R. Yeoman, at the Grammar School, Blackburn Road, Accrington, at 6.15 p.m.

I.A.E.S.T.E.

This somewhat extraordinary aggregation of letters stands for the International Association for the Exchange of Students for Technical Experience. It came into being in January, 1948, and ten European countries participate. The United Kingdom end is handled by the Imperial College Vacation Work Committee and, as they have a successful record in this particular field of activity dating back more than a decade, no better representation could be found. The first annual report has now been issued and amongst the firms supporting the scheme, both British and foreign, are to be found a large number of foundry concerns.

Parents and firms who feel they would like to know more about the scheme should write to the secretary of the organisation, Mr. J. Newby, at the Imperial College, South Kensington, London, S.W.7.

Institute of British Foundrymen — *Lancashire Branch Discussion*

Contraction and Distortion of Iron Castings*

The first general meeting of the Session, over which Mr. Haynes, the Branch President, presided, was held at the Engineers' Club, Albert Square, Manchester. In opening the proceedings Mr. Haynes extended a hearty welcome to Mr. R. B. Templeton, M.I.Mech.E., the National President, and Mr. T. Makemson, M.B.E., the Secretary of the Institution.

At the last meeting, he went on, it was decided to invite youths of 15 to 21 to write a paper on their experiences in the foundry, for which a suitable reward would be given. He hoped the members would encourage the boys to take advantage of the scheme. It was not necessary that the paper should be a technical one, and its length should be from 500 to 1,000 words. He was sure the boys would think it worth their while to try to win a prize.

In introducing Mr. Longden, who subsequently read his paper on "Problems of Contraction and Distortion in Iron Castings," the Chairman observed that if anybody had worked hard for the foundry industry it was Mr. Longden; he was always thinking of something to do, something fresh, and was always prepared to give the best of his knowledge in the interests of the Institute.

Mr. Longden read his paper.

DISCUSSION

MR. JOHN JACKSON, in proposing a vote of thanks to Mr. Longden, said it was running through his mind that if he could have had the benefit, thirty years ago, of the charts and descriptions contained in the Paper, it would have solved many problems he had had to face, and relieved him of many headaches. He was sure that the majority of people interested in iron castings would think it worth while to keep the charts before them for future reference.

MR. H. J. YOUNG, in seconding, agreed with Mr. Jackson that if the Paper had been read thirty years ago it would have saved them much trouble.

The vote of thanks was carried with acclamation.

THE CHAIRMAN remarked that a great deal had been said recently about the part America played in moulding problems, but it had to be borne in mind that it was people such as the Lancashire people who had taught the Americans how to make castings.

Air-cooling Applications

MR. BOYES asked if Mr. Longden would enlarge a little upon the question of the air cooling of castings. Some three or four years ago it was his endeavour to try to cool a heavy casting at an even rate. It had a very heavy bearing in the casting which was cast in the floor, and he took out the core after casting and put two pipes in, one above the other. They cooled the bearing by means of air directed at the heavy bearing. Had Mr. Longden used that method or had he the experience of compressed air being blown on to the castings? He wondered whether that would be too severe. He would like a formula for casting machine tools in two grades of iron. He had had a casting with one portion of one mix joining the top half, away from the heading, which was of another mixing. Referring to one of the slides, he expressed the view that they ought to pay tribute to the Americans for making such a casting.

MR. LONGDEN, in reply, said that in the case referred to by Mr. Boyes, the air stream was directed on to the bare face of the heavy section of the casting—the bearing—by breaking away the core and mould. That was a hot and laborious job. It was quite common not only to apply an air coolant in that way, but also arrange application of cold water, as, for instance, to the bore of a pulley, flywheel or gear wheel. In the examples referred to in the lecture, the heavy central section of the casting—the slideways—were cooled indirectly through the air-cooling system. It would be remembered that air pipes were located below the face of the mould, in contact with denseners (which were of high heat conductivity). Immediately after pouring was complete the air was admitted to the air-cooling system. Thus, heat was more rapidly transferred from the heavy slow-cooling areas than otherwise would be the case. No effort was called for on the part of the operator beyond turning on air from the compressed-air line.

MR. MARKHAM (Bristol and West of England Branch) remarked that the Author considered that it was sometimes wise to remove the core in a heavy casting section soon after solidification, but would he qualify his statement by saying he would at least wait until the change point had been passed. It was difficult sometimes for a foundryman to say which way the pattern or casting was going to distort. It had been put to him that the heaviest section of a casting, or the last section of a casting to cool, would form the inside of a circle. Would Mr. Longden give his views on that?

Logical View of Accelerated Cooling

MR. LONGDEN said there could be little difference of opinion if one just thought clearly about the problem. If it was thought necessary, and remembering the dangers which accompany the direct exposure of a casting

*Paper printed in the JOURNAL, October 7 and 21, 1948.

Contraction and Distortion of Castings

to the air, the earlier the act of bare-ing was carried out, and the more effective it would be. Whatever volume changes there may be in the metal soon after solidification, the earliest possible application of the coolant to the heavy section would favourable induce an equable cooling rate by causing it to fall into line with the cooling rate of the remainder of the casting. He reminded the questioner, again, that the system outlined in the lecture did not depend upon exposing the casting to the outside atmosphere at any time during cooling. The casting was cooled (in the heavy areas) indirectly through the air-pipe system as outlined.

MR. MARKHAM asked whether the heavier metal would form an inside circle.

MR. LONGDEN said it would, depending upon how it was viewed. If one was thinking of the castings dealt with in the lecture, and if no counteracting bend or camber was introduced into the mould, the casting would be convex when viewed from the slideway faces. On the other hand, a box-shaped casting would yield a concave effect on the sides when viewed from the outside. On the question of machining tolerances, with castings described, the longer the casting the greater was the need for increments of machining allowances to take care of the increased hazards of distortion.

MR. COLLINGE asked for further information regarding the pouring with different analyses. If they poured the bottom section of the casting with a 1.5 per cent. silicon and the balance with 2.0 per cent. silicon, they got 1.75 per cent. of silicon. If they poured at a very high temperature, it was beneficial because the section was more homogenous and there was a difference in action.

Iron and Steel Lumps

MR. LONGDEN, using a blackboard sketch of a bedplate, explained the use of two qualities of metal. The lower silicon-content metal was poured in to fill to a point above the slideways at one end of the mould, then the remainder of the mould filled with the softer metal at a higher level from the opposite end of the mould. Sometimes three ladles were employed and the soft metal was poured through top drop gates towards the centre of the mould. The metal at the lower face was not disturbed and one did not get a mixing except at the upper contact levels. The conditions in a cored mould were not the same as would operate if pouring two grades of metal into a ladle. The case could be further illustrated: some years ago it was necessary to produce some stamp blocks in steel. The melting capacity was insufficient. Enough steel was available to provide a deep face of about 4 in. The steel was poured into the mould at the lower mould face from a crucible and the remainder of the metal was added from a ladle filled with cast iron, through an ingate which admitted it, quietly, at a higher level. The castings proved to be excellent stamp blocks with a deep steel face.

MR. FLEMING said that, when dealing with a casting of a much lighter nature subject to the same difficulties, over a period of time he had developed a very strong suspicion, which he was afraid was not supported by detailed measurements, that whilst the analysis might appear to be steady when a certain brand of pig-iron was intermixed, there had been a solidifying effect as well as an analytical effect. Mr. Longden, in the course of years, must have dealt with many hundreds of mixed castings; could he say whether there had been a similar occurrence in his experience?

MR. LONGDEN said one could point out hazards accruing from the inner tolerances on castings. When checking up the results he had discovered that under certain conditions the castings had not come out like the previous ones and, after an analysis, it had not been possible to find sufficient reasons for it. Later it was known how the properties of metal could be influenced by the gas content, dissolved and otherwise. He felt that the investigations of late years into the effects of gases on metals would provide part of the answer to the question. Mr. Young could enlarge on that if he wished, but he knew at one time there was much conflict of opinion about the inherent properties of certain classes of cast iron.

Inherent Properties

MR. H. J. YOUNG (member) said it seemed he was expected to speak about the " inherent " properties of pig-iron and what differences they brought about in castings. His reply must necessarily be based upon what he believed to be a fact, namely, that no two things have been made by man so identical that no test could disclose a difference between them. All depended, therefore, upon the delicacy of the test imposed. Obviously, by reason of different content of gases and of common and rare elements, no two brands of pig-iron were other than unlike one another. Usually, the differences thus caused to castings incorporating first one of them and then the other were undetected and unimportant, but not always. For example, when cast iron for cylinder liners was manufactured from a certain mixture of certain pig-irons and scrap irons, it showed a constant wearing rate under a standard set of service conditions, but that rate would be affected, adversely or favourably as the case might be, by any alteration of the mixture, in the pig-irons or in the scrap irons. This was because the rate of wear of a grey iron responded to minute changes of structure and composition, changes which in ordinary practice would not be apparent. It was when aiming at the *best* wearing rate that these small differences in raw materials needed to be taken into grave consideration. Mass production, namely, an attempt to make many things precisely alike, was liable to produce mountains of difference from molehills of variation.

MR. HUGHES observed that Mr. Longden would agree that the analyses on his graphs would be more valuable to a larger type of casting than the smaller type. With the larger type of casting, the temperature control was not stable, because they carried a larger quantity of metal in the ladle, and there was bound to be a very rapid change and variation in the casting temperature. Mr. Longden had carried out most of his tests on the solidification contraction. They were all aware there

was a reduction in volume even preceding the solidification period. This would apply most specifically, in his opinion, to the smaller type of casting or to a thinner section than in the case of the larger or heavier type. He would like Mr. Longden to give some further information on that point.

Composite Metal for Castings

The two-metal method did not satisfy him; he had tried it, but he would like to know if good results were obtained. Unless there was a great deal of care taken, there must be a certain amount of diffusion of one metal through the other. This would be arrested and controlled by the height of head that was on the casting or the depth of the casting in consequence of the fluid pressure resulting from the head. He would like anyone who had had experience of that type of casting—the coarser grain and lower silicon metal, and the heavier section with the higher silicon—to tell them what results have been obtained.

MR. LONGDEN replied that he had accomplished it time and time again. The greater contrast of steel with cast iron did lend itself to the steel remaining on the lower face. The junction of the cast iron and steel was of a true semi-steel nature. In a large complicated cored mould the lower faces of metal were not disturbed by metal poured in at a higher level through ingates or, in certain cases, even by top drop gates.

MR. HUGHES asked whether there was any lapse of time between the casting of one and the other.

MR. LONGDEN said there was no lapse. There was the intermediate grade of metal merging into the steel or cast iron diffusing up or down. So far as the machine-tool casting was concerned, the metal required for the slideway was of a higher density than the remainder of the casting. The pouring in of the dense metal at the lower levels mitigated against distortion hazards. The act of pouring in at the higher level did not seriously disturb the metal at the lower level.

Effect of Mould Gases

MR. GRAHAM inquired what was the effect on distortion and also on the structure of the metal of gases generated from the mould.

MR. LONGDEN suggested that the gases would affect a thin casting more than a thick one if the pouring of the metal was impeded by gas in the mould cavity. The distance the metal would flow depended not altogether on the superheat and the temperature of the metal; there was also the influence in the mould cavity of the pressure of the gas. The thin casting must have gas outlets to induce the metal to flow and that would influence the distortion. In any case, the thinner casting was prone to a greater degree of distortion than a casting of thicker section. There was a slower rate of cooling when there was a greater body of metal.

The CHAIRMAN said he did not agree with everything Mr. Longden had told them that afternoon about putting air pipes in moulds; it was a very expensive job and, when they worked for the general market, it was a question of whether they were doing right or wrong. Mr. Longden had been successful, but he (the speaker) would not like to change his own standard practice. His firm made castings 24 ft. long with a metal section at the bottom 6 in. thick, with, perhaps, a 20-ton core. After casting, it was left to cool down at the rate of a ton a day. If pipes were introduced, they would not know exactly whether they were doing the job rationally. However, Mr. Longden had done what he had described and had been successful, but he (the speaker) had had the opposite experience.

MR. LONGDEN said it was quite obvious that the type of casting Mr. Haynes had in mind was different from the examples dealt with in the Paper—quite different.

Student's Grant Scheme

The Council of the Institute of British Foundrymen is of the opinion that there are ambitious, promising young men in the foundry industry whose studies and aspirations could be assisted by the provision of funds which they now lack. The Council is therefore prepared to select a young man and to assist him financially in some manner appropriate to his experience, ambitions and needs.

Wide latitude will be allowed in the form of assistance which will be granted. It may, for instance, consist of bearing the cost of a course of study, or of a maintenance allowance whilst an approved investigation is carried out. In general, the award will be confined to men not exceeding 30 years of age, and will be for not more than one year.

Young foundrymen or students preparing for work within the foundry industry who desire to be considered for this award are invited to communicate with the Secretary of the Institute. Fullest particulars should be given by the candidate, including name, age, address, present employer, a chronological account of previous experience, a chronological account of technical studies and full particulars of any investigational work carried out. Most important of all, the candidate should put forward a detailed account of the purposes to which he would apply any grant which might be made. It will be the endeavour of the Council to secure the co-operation of the selected candidate's employers to ensure him continuity of employment.

Applications should be sent to the Secretary of the Institute of British Foundrymen, St. John Street Chambers, Deansgate, Manchester, 3, as soon as possible and in any event not later than March 31, 1949.

National Coal Board Foundries

It is not generally known that the National Coal Board operates no fewer than 15 foundries. They are located at Lochgelly (Fife); Shotts; Ashington; Sacriston; Philadelphia Engine Works; Cadeby; Shireoaks; St. Helens; Cannock Chase; Cannock Wood; Tondu; Tredegar; Writhlington (Somerset); Forest of Dean, and Richborough, Kent.

Prior Fields Foundry

A Black Country Concern Registers Progress

By A. R. Parkes

In the evolution of foundry buildings, methods and processes which is continually going forward as new men, new ideas and more finance become available, the humble beginnings are often lost to sight or conveniently buried. This is not yet the case at the Prior Fields foundry of Norton Industries, Limited, which is in the heart of the Black Country. Here, three "generations" of foundry buildings (when the mechanised scheme is completed) will lie side-by-side. The oldest is a low-roofed, cramped, ill-lit workshop, which, though retained for the present as a "pattern" foundry, is ultimately to be demolished. It has nothing of which to be proud except of being a milestone from which to record progress or as a monument to the craftsmen who worked there and as a birthplace for the castings they turned out, which in turn have made possible the better buildings which follow.

The second building, which constitutes the present foundry, is a large lofty shop and here much progress has been made. Overhead travelling cranes have been installed; different types of moulding have been segregated; the melting furnaces are placed at the ends and gangways have been established.

Moulding Methods

The smaller jobs are now made on machines and for the larger ones mechanical aids are available, in appropriate cases, for turning over. The range of castings produced is very diverse. It spreads from small ball castings of about one ounce, embraces liner plates, agricultural and textile wheels, chucks, drums, a plethora of miscellaneous castings around the 1-cwt. mark, and extends into the machine-tool sphere with base and body castings up to 4 tons. The latter are chiefly for the company's own machines. The maximum size for which tackle is available is 12 ft. dia., or 14 ft. square. Sometimes dry-sand or skin-dried moulds are used and very occasionally loam, but the majority of the work is done in green sand using local Wombourne "red" as the base. A line in which the company has specialised for the last 20 years is the making of white-iron castings for balls, slugs, and linings of cement mills and the like. Moulds for these are made in a stronger and more permeable sand compounded of Congleton silica sand; Wombourne "red," and a clay bond. The metal is separately melted and is made up of specially prepared alloys to give a high Brinell and long wearing life.

In separate buildings are housed the patternshop and core-shop; for the latter, the steel skeleton of a new building is just going up. For fettling there is a Wheelabrator plant and the usual double-ended heavy-duty grinders as well as pneumatic hand tools. The fettling shops—one for the white iron and one for general castings—are served jointly by a motor-vehicle loading bay which divides them. Many of the castings are used in the group's finished production, which includes textile and rubber processing machinery, motorised grinders, brick hoists and smaller tools. Machining and assembly are carried out in a large shop on the same site.

New Extensions

The third "generation" foundry to be built on the site will lie at the side of the existing main bay. Plans are already approved and erection is about to commence. It will be of the completely mechanised type and equipment will include conveyor-served Stone-Wallwork moulding machines, sand-handling plant by Foundry Mechanisations, Limited, and cupolas by Constructional Engineering, Limited; the whole arrangement is in the hands of Foundry Mechanisations, Limited. The new cupolas, like those at present in use, will be charged mechanically by inclined skip-hoist machines. The scheme provides for the erection of new washing facilities for the workpeople and other amenities. There is an existing canteen which serves about 60 full meals per day and snacks and beverages in addition. Two billiard tables and a dart board (which the writer can testify are well used) provide the recreative facilities at present enjoyed by the operatives.

It is expected that when the new section is completed it will render necessary the imposition of full-time technical control and that a laboratory will be added. The writer endorses this conception, for the foundry is even now of a size when some form of specialised control could pay dividends.

Output and Personnel

Just over a hundred are employed at this foundry and, with an output of 125 to 130 tons per week, it means there is a production of 25 cwt. per man. This is a substantial figure for this type of "mixed" production. Nearly all the jobs are on a piece-work basis and the helpers get the same percentage bonus on their rates as the men they serve earn above theirs. Most of the men are described as "semi-skilled," but it is postulated that for a Black-countryman this may mean a higher degree of actual "know-how" than in some other districts. In this part of the Midlands there is a background of more years' heavy industrial activity than any other in the world. It may be that this heritage from father to son produces men who take kindly to foundry and kindred trades, and it probably explains the reputation for careful work and high production per man hour for which the Black Country is renowned.

The writer thanks the directors of Norton Industries, Limited, for permission to view their foundry and to publish these observations; he looks forward to seeing the new section in full operation in due course.

Corrosion-resisting Casting Alloys*

Recent British Developments

By M. M. Hallett, M.Sc., F.I.M.†

In the United States of America a series of nickel-base alloys, known as Hastelloy,‡ A, B, C and D, have been widely used for many years to withstand abnormally severe corrosion conditions. These alloys are based either on the nickel-molybdenum series, sometimes with additions of chromium, or on the nickel-silicon series. The range of available materials enables most corrosive conditions to be withstood. Thus, an alloy of nickel with about 30 per cent. of molybdenum has an excellent resistance to hydrochloric acid of all concentrations at all temperatures, and, in addition, has an outstandingly good resistance to sulphuric acid under all conditions except those involving contact with boiling strong acid. This latter condition is best withstood by an alloy of nickel with about 10 per cent. of silicon. An alloy of general usefulness is obtained at a composition of 18 per cent. molybdenum with 15 per cent. chromium, which, in addition to withstanding the attack of dilute sulphuric and hydrochloric acids over a wide range of temperature, also possesses good resistance to nitric acid and to corrosive metallic salts with high concentrations of chloride ions (such as ferric chloride and cupric chloride) and to free chlorine. The mechanical properties of the nickel-molybdenum alloys are good, and they are machinable without too much difficulty, but the nickel-silicon alloys are more brittle and are generally regarded as unmachinable. Their mechanical properties are, however, greatly superior to those of 14 per cent. silicon iron, which also has a good resistance to corrosion.

Grades Adopted in this Country

In the past, most of the demands for these materials in this country have been met by importation from America, but the changing economic situation has stimulated efforts to develop production facilities on this side of the Atlantic. A useful start has been made, so far as the production of castings is concerned, and (with the co-operation of the Development and Research Department of the Mond Nickel Company, Limited) two or three foundries have made considerable progress towards this goal. Of these, the Sheepbridge Stokes Centrifugal Castings Company, Limited, has introduced a family of alloys, under the trade name of Corrosist, the individual members being referred to as "B," "C," or "D." They are regarded as equivalent to the corresponding grades of Hastelloy. Considerably the largest contract in this field has recently been completed by the Sheepbridge Stokes Company at their Sutton-in-Ashfield works, and a description of this job may be of interest in revealing the satisfactory position which now exists in this country.

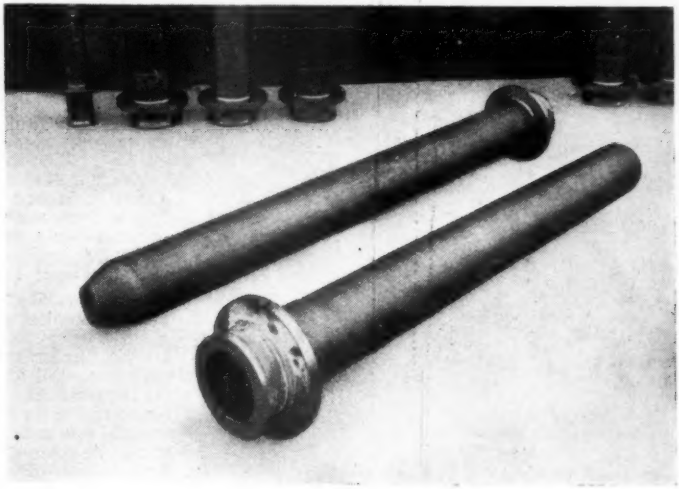


FIG. 1.—CORROSIST "D" HEATER TUBES FOR THE CONCENTRATION OF SULPHURIC ACID.

The contract was from Simon-Carves, Limited, who were erecting a large plant for the vacuum concentration of weak waste sulphuric acid up to 93 per cent. strength under fume-free conditions. The contract called for the use of the nickel-silicon alloy "D," since this grade has an outstandingly good resistance to boiling strong sulphuric acid, and comprised heater-tube castings, valve assemblies and inlet pipes.

Heater-tube Castings

Of these, the major item was the heater tubes, which numbered nearly 100. The finished casting weighed 315 lb. and consisted of a cylindrical tube slightly over 6 ft. long and 7 in. outside diameter, with a wall thickness

*From the *Nickel Bulletin*.

†The Author is chief metallurgist, The Sheepbridge Stokes Centrifugal Castings Company, Limited.

‡Registered trade mark of the Haynes Stellite Company.

Corrosion-resisting Casting Alloys

of ¼ in. The tube was closed at one end and was cast with a flange and spigot portion carrying a coned joint face at the other end. This will be made clear by reference to Fig. 1, which shows two tubes. The tube was required to be straight to within ¼ in. The tolerance on wall thickness was ± $\frac{1}{16}$ in. (as cast) and the finished machined tube was required to withstand a pressure test (in which it was filled with kerosene and held at 400 lb. per sq. in. for 30 min.) without showing any signs of leakage. It will be clear to the foundryman that this is a formidable specification for any material, and was particularly stringent when applied to specialised material of this type. For example, the core had to be entirely supported from the open end of the casting, since chaplets could not be tolerated, and the closed end had to be cast solid without welding.

The valve assemblies included valve bodies and plugs over a range of sizes and in weights varying roughly from 28 lb. to 140 lb. The test conditions on these were less stringent, but similar standards were required as laid down in B.S. 1333 for silicon-iron castings. A 50-lb. kerosene pressure test was applied to the valve-body castings, and to the finished assembly, to check leakage across the seat. The valve plug was of some interest, since it was cast around a mild-steel spindle. The complete assembly of a typical valve is illustrated in Fig. 2. The valve is in the open position and the screwed spindle can be seen running into the top of the Corrosist valve plug. Several plugs were broken open for inspection, and a good joint, entirely free from porosity, was found between the spindle and the plug in each case.

FIG. 2.—CORROSIST "D" VALVE IN "OPEN" POSITION, SHOWING CORROSIST PLUG, WITH CAST-IN MILD-STEEL SPINDLE.

[A two-foot rule in front indicates the size.]

Unusual Types of Castings

Other castings of somewhat unusual types included some extremely long combined valve spindles and plugs, in the longest of which the spindle was 15 ft. 9 in. long and 1¼-in. dia. The principal problem in this type of casting was that of contraction, which led to hot-tearing. It need only be pointed out that the linear contraction on the spindle was 4 in., in order to appreciate the difficulties involved. The inlet pipes, which weighed 420 lb. as finished, were 9 ft. 10 in. long, 6-in. bore, and had a $\frac{3}{16}$-in. wall thickness. They were provided at one end with a standard cone end and flange. In all, nearly 200 castings were produced with a total finished weight of over 17 tons.

The production of these castings calls for a high degree of technical control and first-class foundry equipment. The castings were produced from high-frequency electric furnace melts, with particular attention being paid to control of composition and melting and pouring temperatures. In addition to routine analyses, regular corrosion tests were carried out to ensure that the material was capable of withstanding the service conditions. A contract of this magnitude also called for the provision of much specialised equipment. All the pattern equipment and moulding equipment was made solely for the job and treated on precision-machining lines, working to much finer tolerances than normal in foundry equipment of this type. Only by continuous attention to all such details could the job be successfully completed.

Inspection and Testing

The inspection procedure also justified special equipment. Particularly in the earlier stages of development, many of the castings were subjected to radiographic examination, and all scrap tubes were broken up and the causes of the defects were carefully analysed before making further castings. The layout of the inspection equipment for the pressure tests and dimensional checks on the tubes is illustrated in Fig. 3. This shows three stations for carrying out pressure tests, on two of which tubes are in position. On the right of the photograph can be seen the equipment built for the measurement of wall thickness at any desired point along the length of the casting.

One point illustrated by Figs. 1 and 3 is the good finish obtained on the machined surfaces. This grade of material is normally regarded as unmachinable. It is certainly extremely difficult, having a hardness between 550 and 600 D.P.H., but it has been found that, with suitable equipment and a special technique, facing and turning operations are practicable. The finished faces on these tubes were prepared by turning and not by grinding.

Although this particular job was outstanding by reason of its size and complexity, many other castings have been made in the "D" grade of Corrosist and in the nickel-molybdenum alloys, Corrosist "B" and Corrosist "C." To turn to the other end of the scale, mention may be made of small float castings produced in Corrosist "B" for the British Diesel Oil & Petrol Company, Limited, for use in flow-meters handling sulphuric acid. This application is of some interest, since, although the corrosive conditions are not particularly severe, it is essential that the casting be entirely free from corrosion, as any loss would affect the metering action of the apparatus.

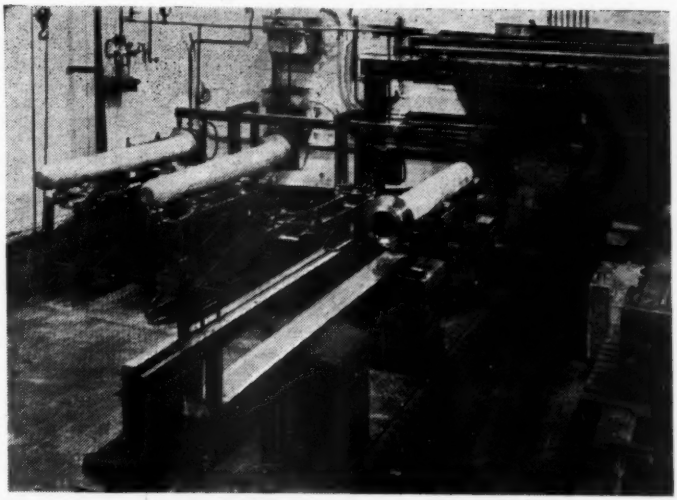


FIG. 3.—TESTING OF CORROSIST "D" HEATER TUBES.

FIG. 4.—A GROUP OF UNMACHINED CORROSIST CASTINGS FOR THE SIMON-CARVES CONTRACT.

AN EXHIBITION covering "Industrial Finishes" is to be held at Earls Court, London, from August 31 to September 13, 1949. Vitreous enamelling is to be featured amongst other surface finishes.

THE RAILWAYS are to carry out tests with radio to ascertain whether it would facilitate any traffic or engineering operations. Announcing this, the Railway Executive report that in addition to fixed radio stations, tests will be carried out with transportable equipment and portable sets for use on vehicles, and by staff on the ground. The tests envisaged will, for example, determine the possible value of wireless for:—(1) communication between shunting-engine drivers, ground staff and control towers in marshalling yards; (2) communication between staff during extensive engineering operations; and (3) communication from a central depot to road cartage collection and delivery vans.

Notes from the Branches

Wales and Monmouth

On December 4 Mr. Harold Williams, of Camborne, Cornwall, addressed a meeting at Cardiff on the subject "Castings Inspection." A well-attended meeting of local foundrymen listened for more than an hour to a description of various methods adopted by an Inspection Department for ascertaining the degree of soundness possessed by castings after they had left the foundry.

Mr. Williams first dwelt upon the qualities necessary in the make up of an Inspector, in order to fulfil the purpose of his appointment. His first duty was to detect any defective castings, then determine whether such defects were sufficiently serious to warrant scrapping the castings. If a casting could be salvaged with its efficiency unimpaired this course should be taken, but failing this there should be no hesitation in marking it down for scrap. The further the casting travelled in the machining line the more costly became the decision to scrap it, its value increasing with each machining operation.

With the aid of illustrations, the author outlined such methods for detecting defects by sight or by sound, as to make any moulder present at the meeting despair of ever getting anything but a perfect casting through the inspection department.

Opening the meeting for discussion, Professor Jones remarked upon the necessity of inspection without which there could not be efficient control of production. This, coupled with co-operation of all concerned, would go far to eliminate the causes of defects, resulting ultimately in improved output.

Following a lengthy discussion, Mr. R. Gould moved a vote of thanks to the lecturer for a very interesting description of his work. Personally he could not afford the expense of a special inspection department, and the decision to retain or reject a casting devolved upon the foundry manager whose judgment might be biased. He was, however, very pleased to thank Mr. Williams for a very able presentation of his subject.

Mr. R. J. Richardson, seconding, said he had followed the lecturer with interest throughout the story, with which he agreed. The buyer would insist upon quality, and it was much better to discover defects before the goods reached the customer, than that costs of machining, transport, *etc.*, should be incurred before rejection. He was pleased to subscribe to this vote of thanks.

Mr. Williams, in his acknowledgment, expressed pleasure at the reception of his effort to present the methods used in operating a department that is essential to any engineering works, though not always popular. The success of such work was assured when the other departments concerned looked upon inspection as helpful rather than critical.

Newcastle-upon-Tyne

The members, at the meeting in the Neville Hall in November, were disappointed that Mr. S. E. Finch was not able to be present, through indisposition, to give his most comprehensive Paper, "Progress and Developments in a Small Steelfoundry"; however, the task was ably undertaken and carried through by his colleague, Mr. G. Barnes, with the assistance of Mr. R. Bygrave and Mr. A. Hill, who had participated in many of Mr. Finch's experiments at the works of Messrs. Catton & Company, Limited, Leeds.

Numerous graphs and tables were projected on the screen and, in addition, there was a display of various castings and test-pieces supporting Mr. Finch's original theories and disproving others. These were passed round the meeting at appropriate intervals and aroused great interest.

The high quality of the steel produced with their Tropenas converter was borne out in an intricate casting where the webs were down to a dimensional thickness of 0.2 in. Mr. Finch had intensively investigated the problem of the clay bond and was still pursuing his search for the perfect or at least an improved bond. He went into detail illustrating the bonding of the sand grains and the disintegration of the latter. He held strongly to the necessity of having different kinds of sand for different classes of castings. Drying stoves were not used by them, having been supplanted by a system where hot-air was led through conduits under the floor to the work places with individual control by the moulder. Keeping moulds for more than 24 hrs. was to be deprecated, as undoubtedly the lapse of time after drying led to loss of strength, whether with green sand or dry sand—this he had proved conclusively, as his figures showed.

Directional feeding, coupled with accurate gating, as recommended by Mr. Finch, was profusely illustrated with diagrams on the screen, examples of tests amply proving his point. A series of experiments with an intricate casting, with which they had had a lot of trouble initially, was shown and a successful conclusion was made clear by models. Mr. Finch was working a good deal on the use of exothermic materials to ensure still better castings and to save materials.

MR. BARNES, in conclusion, said that among the principles that were held in their works was the fostering of a team spirit, and suggested that their practice might be followed with advantage, *e.g.*, the melter had to follow up to see that the metal he was making was doing its part in the production of a good casting; likewise, the coremaker and the moulder followed through their work. Mr. Finch had strong views on fettling and had suggested that managements should carefully examine fettling costs to see if, by producing a cleaner casting, money could be saved in fettling and handling, thereby increasing production.

The meeting expressed its high appreciation of the excellent manner in which Mr. Barnes and his team had carried through their task and passed a hearty vote of thanks, expressing at the same time their hope that Mr. Finch would soon be well again.

MR. G. W. ROUSHAM has recently returned from Australia; he is at present staying at the Glenridge Hotel, Virginia Water.

De-enamelling by Caustic Soda

During a recent visit to the works of Imperial Chemical Industries, Limited, Alkali Division, at Winnington, Cheshire, the writer was particularly impressed with the safety provisions embodied in a pilot plant used for the de-enamelling of defective components by the molten caustic soda process. As is usual, meticulous attention devoted to this aspect has resulted in a sound workmanlike job, when regarded from the dual aspect of constructional reliability and mechanical handling.

The plant inspected consisted of a well-insulated, thick mild-steel tank carrying a ton of caustic. Fig. 1 shows the plant with its protective screens in the closed position, and Fig. 2 the same plant with the screens opened. In this pilot plant, heating was effected by electrodes, but this is not the recommended procedure, and electrical heating by immersion elements is deemed to be most satisfactory. A working temperature of 500 deg. C. is normally used. At the base of the tank is a sludge tray, the sides of which are perforated by ¼-in. dia. holes, suitably spaced. This is shown in Fig. 3.

The components to be de-enamelled are suspended from hooks, leaving three to four inches space between each. They are then racked out, behind a screen, to a position over the bath, where they are lowered in complete safety into the molten caustic. Obviously, dampness is the great danger, but even in this eventuality the screening system affords adequate protection. Immediately on immersion, the heat shock causes much of the enamel to flake off; thereafter solution of the enamel rapidly takes place, leaving but a fine coating of sludge adhering to the component. After 3 to 5 min. the articles are hoisted out, allowed to drain, are racked well away from the bath, cooled, washed by hose pipes, and then immersed in nearly boiling water so that they will dry rapidly. The components are then ready for pickling and re-enamelling.

FIG. 1.—MOLTEN CAUSTIC SODA DE-ENAMELLING BATH WITH SCREENS IN POSITION.

FIG. 2.—BATH WITH SCREENS REMOVED TO SHOW A RACK OF ARTICLES READY FOR IMMERSION.

De-enamelling by Caustic Soda

FIG. 3.—PERFORATED SLUDGE TRAY. THE SHAPE SIMPLIFIES REMOVAL OF THE SOLIDIFIED CAKE.

After about five hours' working, the temperature is reduced to between 380 to 400 deg. C., whereat much of the dissolved enamel is thrown out of solution, and this, together with the finely suspended particles, sinks into the sludge tray. The bath is then brought up to somewhat above normal working temperature, the sludge tray is removed, drained and allowed to cool off. When solid the shape of the tray makes for easy removal of the detritus as a cake. Fortunately, the problem of most local authorities is the disposal of acid effluents, so these cakes will often be found quite handy for neutralisation.

As many heat units are needed for the initial melting of a ton of caustic, it is usual to maintain heat continuously, using the services of the night watchman to switch on, so that, when the shop is ready to commence, the bath is somewhat above normal working temperature. Thus, when cold caustic-soda make-up is introduced by the day shift, proper working temperature is assured with a minimum delay.

(*Concluded at the foot of col.* 2.)

History of Ironfounding

Speaking at Falkirk Rotary Club, last week, Mr. R. Leslie Hunter gave an interesting account of the history and practice of ironfounding. The earliest known iron castings, he said, were Chinese. There was the record of one casting dated about the year 502 A.D., but it was probable that the art was much older. The earliest English iron casting was a tombstone in Sussex, which dated from the middle of the 14th century. Ironfounding did not reach Scotland until the Carron Works were opened in 1759, and in this connection it was strange to note that, although Falkirk was now associated all over the world with castings, Carron was at first known as the "English foundry" because English workers were at first imported. Industrialisation of the district was not always looked upon favourably, and the Minister of Bothkennar had written in the Statistical Account of the English workers: "Their wages are high and the greater part is spent on Saturday in public-houses, which makes them inattentive to ordinances of religion." The middle of the 19th century saw a great increase in the number of foundries, and Falkirk men established foundries in different parts of the country. Falkirk had by this time become recognised as the home of the industry.

Until about 20 years ago, continued Mr. Hunter, most light-castings foundries had made the whole range of products from rainwater pipes to fitted goods, grates and railings. But more recently there had been a rationalisation, with each foundry specialising on a few articles. His own foundry, at Gowanbank, had concentrated on the making of bath tubs, and to-day between the local foundry and the associated foundry in England, they turn out 180,000 baths a year—just over half the production of Great Britain. Cast-iron baths were only introduced into homes within the last 70 or 80 years. He had been approached some years ago by the Bronte Society wtih an inquiry regarding a cast-iron bath found in Haworth Vicarage which they thought might have been the property of the Brontes. After some investigation, and in view of the fact that the Brontes left Haworth in 1861, he was able to assure them that it had never been used by Charlotte Bronte. Some people wondered where all the new baths that were produced went. There were many thousands of houses in the country still without baths and, together with the new houses being built, they provided a market sufficient for many years ahead. Then there was the export market, which took quite a large proportion of the production, mostly the luxury article.

OFFICERS of the Midwest Research Institute of the United States announce the appointment of Dr. George E. Ziegler as Director and Dr. Clayton O. Dohrenwend as Assistant Director of the Institute.

The demand for this process is growing; already there are about half-a-dozen installations. At a time when steel for sheets is in short supply and where an otherwise satisfactory component is condemned because of some defect in the enamel finish, this process is successfully filling an urgent need, and moreover is doing it quite competitively.

Scottish Light Castings Industry

(From our Scottish Representative)

The past year has been marked in Scottish ironfounding circles by solid achievement in the face of difficulties. Although production generally has remained below pre-war levels, a steady upward trend has persisted. The nettlebed of problems left by the war has been to some extent cleared during the year, which has seen further advances into the field of mechanisation, and a resulting abatement of the serious shortage of man-power. New and vitally-needed plant, although still difficult to obtain, has been more readily available than in the previous year. But 1948 has also brought with it a problem which at first seemed to threaten a serious cut in production—the slackening of the housing drive.

To an industry running cog-to-cog with house production, the news of this decision came as a heavy blow. And no relief was offered in the export field, though world markets were clamouring for Falkirk-made goods. Indeed, the fretting restrictions on export remained inexplicably in force. But the unwelcome news had at least one desirable result. During the pressure of housing work many ranges of general castings had been laid aside and backlogs of orders, stretching back in some cases to 1939, had not been completed. These orders now filled the bill to some extent. But there was also an important development. During recent years a silent but none-the-less significant revolution has been taking place in methods of home heating, a revolution which, it would not be too much to claim, will eventually change many of our home habits. By present methods of heating houses, and with the present fuel scarcity, usually only one room in a house is kept comfortably warm during winter months; by the new methods, created out of much patient research and ingenious designing, the whole house can be warm and usable with much less expenditure of fuel. A whole new range of heating and cooking units designed to consume very little fuel and to aid in smoke abatement, has been prepared and put into production. Some of the new designs are being widely incorporated in new housing developments, but wider markets are assured once the significance of this important development is appreciated by housing authorities in this and other countries. In this field alone vistas of continued and increasing prosperity have been opened up during the past year.

Though the labour problem was much less acute than in the preceding year, there was still a substantial lack of skilled moulders and apprentices. Post-war reluctance of many skilled tradesmen to return to the industry has, however, abated to some extent, and it is expected that higher figures of employment will yet be recorded before anything like saturation is reached. Experiments in "green" labour have not been an unqualified success, but they have assisted in bridging the labour gap. Man-power shortage, though less acute, presents no easy solution. Innovations presenting more attractive employment have been partly successful, but all the indications are that the industry is attempting a solution on the lines of greater mechanisation. Many foundries in the area have committed themselves to new mechanised plants, and considerable advances were made in mechanical technique leading to an increased productivity of castings. Technical efficiency, however, still lagged behind the furthest advances of science in this sphere, but the coming year is expected to see further developments.

A problem more serious in its implications than any with which the foundries have been faced has been the shortage of pig-iron, which during the year was being delivered on a hand-to-mouth basis. Blast-furnace production of foundry pig-iron was sacrificed to some extent in favour of basic pig-iron for steel-works. The solution of this problem seems to lie in the speeding up of the building of blast furnaces for the production of pig-iron, thus lessening the dependence of foundries on scrap iron.

During the year the Government plans for the nationalisation of the iron and steel industry have been made known. The only local firm concerned in the proposed nationalisation is the Carron Company. The pros and cons of the proposed measure have been widely argued, but it is difficult to believe that under nationalisation, the Carron Company, which has occupied a position unique in the industry's history, will be benefited substantially. On the contrary, it may conceivably be that this firm, whose products have been synonymous with the best in ironfounding, and which has made the name of Falkirk known from China to Peru, will lose that identity with its illustrious past that has been its proudest boast.

Yet, all-in-all, prospects for the new year appear to brighten. Resumption of something approaching a large-scale housing programme in the coming spring promises well for the industry. New problems there will undoubtedly be, but to an industry which has shown such adaptability in the past, new problems will be but stepping stones to a brighter future.

Recent Shipbuilding Orders

The following are among shipbuilding orders recently announced:—

CLELANDS (SUCCESSORS), LIMITED, Wallsend, 980-ton motor coaster.

ALEXANDER HALL & COMPANY, LIMITED, Aberdeen, a 625-ton steam trawler for West Hartlepool owners.

GREENOCK DOCKYARD COMPANY, LIMITED, a single-screw motor tanker of 16,500 tons dw. for the Hadley Shipping Company, Limited, London.

THE PARTNERSHIP BETWEEN Hugh Iorys Hughes and Arthur Benjamin Newby, carrying on business as consulting engineers, at 66, Victoria Street, Westminster, London, S.W.1, under the style of H. Iorys Hughes, has been dissolved. Debts will be received and paid by H. I. Hughes.

THE PARTNERSHIP BETWEEN Kenneth Sydney William Eansor and Joseph Maud Wyatt, carrying on business as general electro-platers at 35, Sekforde Street, Clerkenwell, London, E.C.1, under the style of J. M. Wyatt (Platers), has been dissolved. Debts will be received and paid by J. M. Wyatt.

New Year Honours

Details of Some Awards

The New Year Honours List contained the names of a number of people associated with the foundry industry. We give below brief details of some of the awards.

PRIVY COUNCILLOR

LORD HAILEY, chairman of the Colonial Research Committee and a director of Vickers, Limited, and other companies.

KNIGHTS

MR. JOSEPH HOLLAND GODDARD, president of the Machine Tool Trades Association. He is chairman and governing director of Wadkin, Limited, manufacturers of woodworking machinery and patternshop equipment, of Leicester, and a director of National Steel Foundry (1914), Limited, Leven, Fife, and the Imperial Typewriter Company, Limited.

MR. HENRY LEWIS GUY, D.Sc., F.R.S., chairman of the Mechanical Engineering Research Organisation, Department of Scientific and Industrial Research, and secretary of the Institution of Mechanical Engineers. He was chief engineer of the mechanical department of Metropolitan-Vickers Electrical Company, Limited, from 1919-42. In 1939, Mr. Guy was appointed a member of the Advisory Council for Research and Development, Ministry of Supply. He has also served on a number of other committees.

MR. DONALD MACLEAN SKIFFINGTON, a director of John Brown & Company, Limited, Clydebank. He passed through all the main departments of the company before becoming foreman at the age of 30, shipyard manager in 1916, and soon afterwards a local director. He retired from the position of shipyard director in 1947, but continued as shipyard consultant and a director of the company's main board.

ORDER OF THE BATH

G.C.B.

SIR HENRY THOMAS TIZARD, K.C.B., A.F.C., F.R.S., chairman of the Defence Research Policy Committee of the Ministry of Defence. He was permanent secretary to the Department of Scientific and Industrial Research, 1927-29, and Rector of the Imperial College of Science and Technology, 1929-42. Sir Henry was chairman of the Aeronautical Research Committee, 1933-43, and a member of the Council of the Ministry of Aircraft Production, and an additional member of the Air Council, 1941-43. He was a Development Commissioner, 1934-45, and an Albert Gold Medallist of the Royal Society of Arts, 1944, while he was a gold medallist, Franklin Society of Philadelphia, in 1946.

K.C.B.

COL. PAUL GOTTLIEB JULIUS GUETERBOCK, chairman of the Territorial and Auxiliary Forces Association of the County of Gloucester. He is chairman of the British Non-ferrous Smelters' Association and a past-president of the Institute of Metals. He is managing director of Capper Pass & Son, Limited, Bristol.

ORDER OF THE BRITISH EMPIRE

C.B.E.

LORD ABERDARE, chairman, National Association of Boys' Clubs, chairman of Duffield Lindley & Company (Metallurgical & Finance), Limited; A. BLAIR, engineer manager and a director, Harland & Wolff, Limited, Belfast; H. G. BROTHERTON, general secretary, National Union of Sheet Metal Workers and Braziers; P. A. COOKE, Director of Engine Production, Ministry of Supply; COL. W. C. DEVEREUX, managing director, Almin, Limited, chairman, International Alloys, Limited; I. G. EVANS, assistant secretary, Department of Scientific and Industrial Research; J. A. MILNE, chairman and managing director, J. Samuel White & Company, Limited, Cowes; J. MITCHELL, managing director, iron and steel production, Stewarts and Lloyds, Limited, vice-president of the Iron and Steel Institute; R. E. J. MOORE, assistant secretary, Board of Trade, Director, British Industries Fair; ALDERMAN CHARLES TERRY, chairman, Redditch, Bromsgrove and District Local Employment Committee, chairman and managing director of Herbert Terry & Sons, Limited, Redditch, and a director of the Enfield Cycle Company, Limited; H. WILMOT, president, Locomotive Manufacturers' Association of Great Britain, managing director, Beyer, Peacock & Company, Limited, Gorton, Manchester.

O.B.E.

CAPT. J. J. C. ALLEN, governing director, John Allen & Sons (Oxford), Limited; R. BAILEY, joint managing director, Charles Roberts & Company, Limited, Horbury Junction, near Wakefield; ALDERMAN G. CLARK, chairman, Chesterfield Local Employment Committee, and chairman and managing director of the Bryan Donkin Company, Limited, Chesterfield, and a director of other companies; H. C. HALL, metallurgical research consultant to Rolls-Royce, Limited; R. J. MAGOWAN, manager and a director of the Portadown Foundry, Limited, Portadown, Co. Armagh.

M.B.E.

MISS D. L. H. ALLSOP, private secretary to the chairman, Iron and Steel Board; J. ANDERSON, joint managing director, Anderson, Boyes & Company, Limited, Motherwell; J. ARNOLD, works production manager, Dubilier Condenser Company (1925), Limited, Kirkby, Lancs; H. BOWNESS, tractor production superintendent, Marshall Sons & Company, Limited, Gainsborough, Lincs; W. BUCHANAN, chief production engineer, G. & J. Weir, Limited, Glasgow; A. W. BURGE, machine-shop and tool-room superintendent, De Haviland Engine Company, Limited; J. T. BYRNE, secretary, Clyde District Committee, Confederation of Shipbuilding and Engineering Unions; W. R. EASOM, ship manager, Silley Cox & Company, Limited; Falmouth; C. A. GUTSELL, chief designer, Elliott Bros. (London), Limited; J. R. HENDERSON, general manager, Weldall & Assembly, Limited, Droitwich; G. B. HILLMAN, executive officer, Department of Scientific and Industrial Research; W. HUNTER, chief draughtsman, Northern Manufacturing Company, Limited, Gainsborough, Lincs; G. C. IBBOTT, chief test engineer, W. H. Allen, Sons & Company, Limited, Bedford; P. A. JOB, a director, Llanelly Steel Company (1907), Limited.

T. R. MARTIN, general manager, Metal Box Company, Limited, Neath; H. R. ROWBOTHAM, member, Wolverhampton District Committee, Midland Regional Board for Industry, joint managing director, Joshua Bigwood & Son, Limited, Wolverhampton; R. J. SILVER, chief inspector, Rist's Wires & Cables, Limited; A. E. WARD, manager, Import Department, British Iron and Steel Corporation; R. J. WILLIS, apparatus works engineer, Siemens Bros. & Company, Limited; P. WOODWARD, senior plant manager, Imperial Chemical Industries, Limited.

BRITISH EMPIRE MEDAL

Civil Division

E. ADAMS, leading erector, Stanton Ironworks Company, Limited, Ilkeston, Derbyshire; T. ALLEN, chargehand moulder, Manganese Bronze & Brass Company, Limited, Birkenhead; W. E. BROOK, senior bronze machine-shop foreman, Hopkinsons, Limited, Huddersfield; E. J. BULLOCK, joiner, Parnall & Sons, Limited, iron and brass founders, etc., of Bristol; H. J. W. CLARE, turner, Vickers-Armstrongs, Limited,

(*Continued on next page, col. 1*)

Increases of Capital

Details of increased capital have been announced by the following companies:—

ALCO ENGINEERING COMPANY, LIMITED, Warrington, increased by £900, in £1 ordinary shares, beyond the registered capital of £100.

CROCKETT LOWE, LIMITED, engineers, etc., of Birmingham, increased by £2,000, in £1 shares, beyond the registered capital of £1,000.

SANDS PRECISION, LIMITED, engineers, etc., of Chorley, Lancs, increased by £5,000, in £1 ordinary shares, beyond the registered capital of £7,500.

KELBROOK METAL PRODUCTS, LIMITED, Earby, near Colne, increased by £5,000, in £1 ordinary shares, beyond the registered capital of £5,000.

METALFORM, LIMITED, engineers, founders, etc., of London, W.C.1, increased by £2,500, in £1 ordinary shares, beyond the registered capital of £5,000.

BURN & ORSON WRIGHT, LTD., ironfounders, engineers, etc., of Leicester, increased by £6,000, in £1 ordinary shares, beyond the registered capital of £4,000.

CORNISH & LLOYDS, LIMITED, engineers and ironfounders, etc., of Bury St. Edmunds, increased by £10,000, in £1 shares, beyond the registered capital of £10,000.

UNIFURNACES, LIMITED, engineers, furnace and kiln manufacturers, etc., of London, E.C.2, increased by £15,000, in £1 shares, beyond the registered capital of £15,000.

H. J. STONE STEEL COMPANY, LIMITED, steelmakers, engineers, etc., of Wellingborough, increased by £3,000, in £1 ordinary shares, beyond the registered capital of £2,000.

TEXTILE SYNDICATE (LEICESTER), LIMITED, manufacturers of machinery and plant, etc., of Leicester, increased by £4,500, in £1 ordinary shares, beyond the registered capital of £500.

JOSEPH COOK SONS & COMPANY (1930), LIMITED, iron and metal manufacturers, etc., of Washington, Co. Durham, increased by £15,000, in £1 ordinary shares, beyond the registered capital of £45,000.

W. CHRISTIE & GREY, LIMITED, machinery and plant manufacturers, etc., of London, E.C.3, increased by £50, in 1s. 5 per cent. cumulative preference shares, beyond the registered capital of £100.

HYDRAULIC COUPLING & ENGINEERING COMPANY, LIMITED, Isleworth, Middx, increased by £25,000, in £1 5½ per cent. redeemable cumulative preference shares, beyond the registered capital of £175,000.

AIR CONTROL INSTALLATIONS, LIMITED, Ruislip, Middx, increased by £62,500, in 50,000 6 per cent. redeemable cumulative preference and 12,500 "A" ordinary shares of £1 each, beyond the registered capital of £50,000.

DENING & COMPANY (1937), LIMITED, general engineers, etc., of Chard, Som, increased by £150,000, in 47,500 ordinary and 102,500 5½ per cent. redeemable cumulative preference shares of £1 each, beyond the registered capital of £100,000.

H. & C. DAVIS & COMPANY, LIMITED, ironworkers, etc., of Clapham Common, London, S.W.4, increased by £433,000, in 262,050 5½ per cent. cumulative preference shares of £1 and 1,709,500 ordinary shares of 2s. each, beyond the registered capital of £67,000.

(*Continued from previous page*)

Dartford, Kent; R. DAVISON, flanger, Robert Stephenson & Hawthorns, Limited, Darlington; J. W. ETHERINGTON, ship frame erector, Cook, Welton & Gemmell, Limited, Beverley, Yorks; J. C. HOWARD, slinger, Kendall & Gent, Limited, Manchester; J. HUSBAND, planer, William Beardmore & Company, Limited, Glasgow.

L. W. LAWS, fitter and erector, Davey, Paxman & Company, Limited, Colchester; W. LEACH, leading furnace hand, Talbot-Stead Tube Company, Limited, Walsall; MISS Z. E. LLOYD, polisher, Richard Thomas & Baldwins, Limited, Brierley Hill, Staffs; H. LONG, chief tool designer, R. & J. Beck, Limited, Hendon, London, N.W.9; S. MEGRAW, plater, Harland & Wolff, Limited, Belfast; A. NIXON, foreman, Guest, Keen & Nettlefolds, Limited, Wednesbury, Staffs; W. H. PROCTOR, foreman, John I. Thornycroft & Company, Limited, Woolston, Southampton; J. RATHBONE, foreman, Hale & Hale (Tipton), Limited.

Cast-iron Pipe Corrosion

Committee of Inquiry

A departmental committee has been appointed by the Minister of Health to investigate the problem of corrosion in cast-iron pipes. The committee's terms of reference are:—"To consider the extent to which there is evidence of early deterioration of cast- and spun-iron pipes, the causes of any such deterioration, and the measures that should be taken to prevent it; and to report to the Minister."

For some time evidence has been accumulating of the rapid external corrosion of cast-iron and spun-iron water pipes, especially those laid in clay subsoils containing sulphates. One result has been an unduly large number of bursts, and in some cases water mains have had to be replaced only 10 years after being laid. This tendency to premature corrosion is of serious concern in view of the Government's large programme for supplying pipe water to rural areas.

The members of the new committee are:—

Lt.-Col. F. G. Hill (chairman), Mr. G. M. Binnie, Mr. J. C. O. Burns, Mr. H. J. Escreet, Dr. J. C. Hudson, Dr. A. Key, Mr. R. W. Melvin, Mr. E. Morgan, Mr. W. P. Rees, Mr. C. A. Risbridger, Dr. W. H. J. Vernon, Mr. E. Wharton, Mr. L. C. Whiskin, Mr. E. H. Williams, Mr. J. B. Windsor-Richards, and Mr. J. Noel Wood. Mr. C. H. Spens and Mr. A. L. Vincent (Ministry of Health) are the secretaries of the committee.

Opposition to Steel Bill

An explanation of why the Engineering Industries Association has publicly stated its opposition to the Iron and Steel Bill has been circularised among the 3,500 members by Lord Davidson, president of the Association. He says the Association is not concerned with party politics, and owes allegiance to no political body, but as the Government affects the day-to-day working of all engineering firms, it is inevitable that the Association should be compelled to enter the field of Government policy.

The Association opposed the Bill to nationalise 107 out of the 2,000 firms composing the iron and steel industry because it believed the policy to be harmful to every engineering firm.

October's Production Peak

Provisional figures issued by the Treasury show that industrial production in October was the highest figure recorded to date. The index number in the month was 127, against 124 the previous month.

Details in the "Ministry of Labour Gazette" reveal that the number of days lost in industrial disputes in November last (88,000) was only half as many as in the corresponding month of 1947. The total for the first 11 months of 1948 was about 440,000 fewer than in the corresponding period of 1947, the figures being 1,912,000 last year and 2,353,000 in 1947.

W. E. KAY & SONS, LIMITED, engineers, welders, etc., of Rossendale, Lancs, is being wound up voluntarily as the company has entered into an agreement to sell the business as a going concern. Mr. E. Schofield, 4, Chapel Walks, Manchester, 2, is the liquidator.

Obituary

DR. GEORGE SHERBROOK TURPIN, who was the first principal of Swansea Technical College, has died at the age of 83.

DR. HEINRICH KONEN, of Bonn, a German physicist who invented spectral lens to search for rays in atmosphere, has died at the age of 75.

MR. ALAN W. MONTGOMERY, proprietor of James Fergus & Company, iron and steel stockholders, of Glasgow, died suddenly at sea on New Year's Day. He was 70.

MR. JOHN SUTHERLAND SIMMS, Diesel engineer of the Wallsend Slipway & Engineering Company, Limited, has died at the age of 58. He had been with the company for 32 years.

MR. FREDERICK KILFOIL, formerly for over 50 years chief maintenance engineer of Harrison & Son (Hanley), Limited, vitreous enamellers, of Stoke-on-Trent, has died at the age of 54.

MR. WALTER LOCKE, formerly machine-shop manager of Thomas Firth & John Brown, Limited, steel manufacturers, of Sheffield, for 35 years, died suddenly on December 28. He was 74.

MR. HAROLD LESLIE FRANK, a director and secretary of G. Hopkins & Sons, Limited, brewers' and bottlers' engineers and coppersmiths, of Highbury, London, N.7, died on December 23. He was 49.

MR. DAVID MITCHELL, retired draughtsman, who was employed for many years by the Kilmarnock firm of Glenfield & Kennedy, Limited, hydraulic engineers and founders, etc., has died at the age of 82.

MR. C. J. HARRISON, who has died at the age of 59, was manager of the magnet department of Swift Levick & Sons, Limited, steel manufacturers, of Sheffield. He had been with the company for 43 years.

MR. WILLIAM EDGAR HAWTHORNE, a director and secretary of Cannon Iron Foundries, Limited, Bilston, Staffs, died on January 2, at the age of 63. He had been with the company since leaving school.

MR. HENRY CHARLES INSTONE, former managing director of Orme, Evans & Company, Limited, enamellers and sheet-metal workers, of Wolverhampton, has died at the age of 86. He was associated with the company for 47 years.

MR. WILLIAM NELSON, formerly for a long period secretary of the South Coast Engineering and Shipbuilding Employers' Association, Southampton, has died at the age of 79. Mr. Nelson was awarded the M.B.E. for his work in an Admiralty department during the 1914-18 war.

MR. WILLIAM TAYLOR has died at his home at Felling-on-Tyne at the age of 76. He was senior director of Clarke, Chapman & Company, Limited, manufacturing marine engineers, boilermakers, etc., of Gateshead, with whom he started as a junior clerk some 56 years ago. For the past 26 years he had been commercial director. Mr. Taylor also held the position of vice-chairman of Clyde Crane & Booth, Limited, Gateshead.

Standardisation on the Railways

Savings from Initial Steps

Considerable progress with the preparation of preliminary designs for standard locomotives and rolling stock for British Railways is reported by the Railway Executive. Although in view of the very large number of units involved (19,726 locomotives, 55,379 coaching and 1,178,993 freight vehicles) the Executive's policy of standardisation must necessarily be a long-term one, it is anticipated that, in addition to the direct supersession of old units by new ones, considerable use will be made of new standard details in the repair of non-standard vehicles.

The Railway Executive has inherited the accumulated results of a large number of separate standardisations, but in spite of this, the stock which it has taken over from the former companies is far from being standardised as a whole. The Executive took up as one of its first and most urgent tasks the promotion of the highest practicable degree of standardisation throughout its rolling stock. While this is essentially a matter of long-term policy, it is also one capable of giving progressive savings as it proceeds towards completion, and a many-sided "attack" has been initiated.

Standardisation of complete units is well into its initial stages, and proposals are nearing completion for the first two standard steam locomotive classes out of a possible 12, and for standard type of chassis and mechanical equipment for a single type of Diesel shunting locomotive. Preliminary designs are also being worked out for a basic all-steel carriage design suitable for mass production. This subject is in the last stages of decision regarding Civil Engineers' route availability, and on operating and commercial aspects such as size of compartment and number of doors. The final decision will rest on questions of strength and safety and on available manufacturing facilities. Work has commenced on standard merchandise and covered goods wagons, and other types will be dealt with in relation to operating needs.

The biggest result for standardisation in railways rolling stock will arise as increasing numbers of new units are built to standard designs and embodying standard details. A lesser, but valuable, result will accrue in so far as these standard details can be applied as renewals are required to existing stock with little or no structural alteration. There will remain, however, a residue of features and details on the new standard rolling stock where the expenditure involved in applying them to existing vehicles could not be justified.

G. D. KHAIRULLAH, 105, Apollo Street, Fort Bombay, India, wishes to secure United Kingdom agencies for semi-rotary hand pumps and brass water fittings. Interested companies should communicate with the firm direct, at the same time notifying the Export Promotion Department, Board of Trade, Thames House North, Millbank, London, S.W.1 (reference, E.P.D. 44213/48), of any action taken.

Narrowing the Trade Gap

Fruits of Free Enterprise

The January issue of the journal of the National Union of Manufacturers states that success so far achieved in narrowing the trade gap has been possible only by free enterprise. Pride displayed by Ministers in this achievement is really a tribute to free enterprise, asserts the Union, which adds that trade agreements with foreign countries are of real value only to the extent to which the goods received are acceptable as to both price and quality.

In reviewing the outlook for 1949, the Union states that price competition is likely to increase abroad, and that at home some further relaxation of controls may be offset by uncertainty resulting from State monopoly of many essential goods and services. The Union maintains that manufacturers have the right to know, and as early as possible, the price and availability, within reasonable limits, of coal, gas, electricity and transport. Without this knowledge, ability to meet overseas competition will be seriously reduced. Even more important than the knowledge of such facts is the right to be consulted when these decisions are being made, and the Union promises that if existing consultation machinery is found to be deficient it will lose no time in approaching the appropriate authorities.

Foundation of Industrial Prosperity

The belief is expressed that self-disciplined, well-ordered free enterprise is the foundation of Britain's industrial prosperity and that, therefore, manufacturers should be represented by an organisation "which is powerful enough to ensure that adequate consideration shall be given to their legitimate interests when matters of industrial policy are discussed at Government level."

The need for improving industrial relations is emphasised, and the Union advocates the replacing of suspicion and distrust at present existing between many employers and employees with mutual confidence and co-operation. One way of achieving this, it says, is to provide every employee with all available information, particularly statements showing the distribution of income between wages, working costs and profits. "Co-operation should mean greater self-discipline, first by the employer himself and through his leadership and example to the most humble member of the organisation."

A Momentous Year

In a message to the journal, Sir Patrick Hannon, M.P., president of the National Union of Manufacturers, says: "The new year may well be one of the most momentous in the history of British industry." It would prove if, and to what extent, State-controlled and free enterprises could work harmoniously and effectively in juxtaposition. The Union had consistently asserted its belief that the continuance of wisely-directed free enterprise was essential to Britain's economic health and prosperity, and that the administrative machinery of the country, by its very nature and constitution, was unsuited for the control and direction of productive industrial enterprise.

"In that faith, we shall continue to work to safeguard the legitimate interests of free enterprise. The steps which the Union has already taken to this end have aroused such an enthusiastic response amongst manufacturers in all parts of the country that this new year may well see our organisation reach new record heights of achievement, strength and prestige."

Government Training Exhibition Policy

Advisory Committee Appointed

Since the war Government policy on trade exhibition questions has been based on the report of the Ramsden Committee, which considered the whole question towards the end of 1945. Doubt has recently been expressed in some quarters as to how far the validity of the Committee's recommendations may have been affected by the trend of our post-war economic circumstances which they could not have foreseen clearly. New projects for exhibitions in various forms are constantly being put before the Board as offering a useful contribution to the solution of our external trade problems and the value of a standing committee of experienced business men to advise on such projects in the light of current conditions has been appreciated for some time. To meet this need an Exhibitions Advisory Committee has been set up under the chairmanship of Sir Guy Locock, a vice-president of the Federation of British Industries and a member of the Ramsden Committee. The Committee as finally constituted will afford a cross section of those most closely concerned and most experienced in export problems.

It has been necessary to draw up the 1949 programme of official participation in trade fairs overseas without waiting for the views of the new Committee. So far as overseas trade fairs are concerned the number of pressing invitations increases rather than diminishes each year and the choice has been a process of elimination. Negotiations are at present in progress for suitable sites and it appears likely that official information stands will be installed at Poznan (April 23-May 10), Toronto (May 31-June 10), Stockholm (August 24-September 10), and Utrecht (September 6-15).

The members of the Exhibitions Advisory Committee so far appointed are:—

MR. ALLEN L. STOCK, Morgan Crucible Company, Limited (nominated by the Association of British Chambers of Commerce); MR. MOIR MACKENZIE, Federation of British Industries; MR. H. C. MARSHALL, Service Button Company, Limited (nominated by the National Union of Manufacturers); SIR LUKE FAWCETT, Amalgamated Union of Building Trade Workers (nominated by the T.U.C.); SIR HARRY LINDSAY, chairman of Council, Royal Society of Arts; MR. W. L. CHANCE, Chance Bros., Limited, Smethwick; MR. J. DAVIDSON PRATT, Director of the Association of British Chemical Manufacturers; MR. C. H. DAVIS, Reliance Electrical Wire Company, Limited, Leyton, London, E.10; MR. REAY GEDDES, Dunlop Rubber Company, Limited; MR. E. W. GOODALE, Warner & Sons, Limited, London, W.1; MR. R. GRESHAM COOKE, Director of the Society of Motor Manufacturers & Traders, Limited; SIR E. RAYMOND STREAT, chairman of the Cotton Board.

News in Brief

ENGINE REPAIRS to the 8,582-ton oil tanker British Princess, built at Sunderland in 1946 by Sir James Laing & Sons, Limited, which has arrived in the Tyne after being towed 6,700 miles from Abadan in the Persian Gulf, will be carried out by the North Eastern Marine Engineering Company (1938), Limited.

AN ORDER has been placed by the Steel Company of Wales, Limited, with the Brush Electrical Engineering Company, Limited, Loughborough, for four 0-6-0 Diesel-electric shunting locomotives for use at the company's Port Talbot works. The locomotives have been specially designed to meet the arduous conditions of steelworks' railway operation.

THE NEW FACTORY at Watling Street, Motherwell, of Metropolitan-Vickers Electrical Company, Limited, is to begin production of a new and advanced design of watt-hour meters for domestic service and switchboard instruments for power station and general industrial use early this year. The factory was taken over by the company 12 months ago.

STOCKHOLDERS OF Associated British Engineering, Limited, Loughborough, have approved resolutions in connection with the acquisition by the Brush Electric Engineering Company, Limited, Loughborough, of Mirrlees, Bickerton & Day, Limited, oil-engine manufacturers, of Stockport, and J. & H. McLaren, Limited, agricultural engineers, of Leeds.

LARGELY OWING to the increased intake of iron ore, manganese ore and iron and steel scrap, Tees imports for the first 11 months of 1948 totalled 3,166,005 tons, which is 665,000 tons better than in the corresponding period of 1947 and over 1 million tons above the 1938 figure. The exports for the same period reached 1,085,919 tons, compared with 995,550 tons in 1947 and 1,829,595 tons in 1938.

ESSANBEE PRODUCTS, LIMITED, announces that its address is now 10, Albert Embankment, London, S.E.11. At the beginning of last year the company acquired the business of John Hosking & Sons, Limited, and it has now been decided to amalgamate the two businesses. In future, therefore, the title of the company will be Essanbee Products, Limited, incorporating John Hosking & Sons, Limited. The business is to be expanded to incorporate iron and steel, bolts and nuts, tools, and general engineering supplies. The business of John Hosking & Sons was founded in 1824.

MR. I. A. R. STEDEFORD, chairman, and other members of the board of Tube Investments, Limited, addressed a meeting of over 500 representatives of the 30,000 employees of the company at the Broadwell Works, Oldbury, Birmingham, on January 4. The speakers outlined the present position of the 37 subsidiary companies in the group, discussed their economic and industrial operations and problems, and dealt with future prospects. After questions, the representatives inspected an exhibition at the works, showing the group's main products and their industrial applications.

New Patents

The following list of Patent Specifications accepted has been taken from the "Official Journal (Patents)." Printed copies of the full Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s. each. The numbers given are those under which the Specifications will be printed, and all subsequent proceedings will be taken.

605,448 ELECTRO MANGANESE CORPORATION. Electro-deposition of manganese.

606,330 JENNINGS, H. W. K. (Al-Fin Corporation). Ferrous metal articles coated with aluminium or aluminium-base alloy.

606,389 UNDER WATER WELDERS & REPAIRERS, LIMITED, and BOOT, R. H. F. Electric-arc cutting of metals.

606,401 MILES & PARTNERS (LONDON), LIMITED, J., and ROBIETTE, A. G. Heating and reheating of ferrous metals.

606,534 JONES & ATTWOOD, LIMITED, and FOLKES, H. L. Production of foundry moulds.

606,593 BRITISH CAST IRON RESEARCH ASSOCIATION, MORROGH, H., and BERNSTEIN, J. Manufacture of iron castings.

606.663 BRISTOL AEROPLANE COMPANY, LIMITED, and BETTERIDGE, W. Chromium-carbon steels for bearing races and heat-treatment processes therefor.

606,734 IMPERIAL CHEMICAL INDUSTRIES, LIMITED, and GOSKAR, T. A. Heat-treatment of steel.

606,737 LYCHE, E. Plate shearing machines.

606,767 PRESSED STEEL COMPANY, LIMITED, and BARKS, D. T. Welding machines.

606,958 BUDD MANUFACTURING COMPANY, E. G. Resistance weld control method and apparatus.

606,966 Soc. ANON. DES ATELIERS G.S.P. GUILLEMIN, SERGOT, PEGARD. Devices for indicating cutting speeds in machine tools.

606,996 BIRLEC, LIMITED, and HANCOCK, P. F. Manufacture or production of steel or alloy steel strip.

607,167 STEIN & ATKINSON, LIMITED, and WILLIAMS, C. H. Heat-treatment furnaces.

607,209 Soc. ANON. J. COCKERILL. Process for producing steel with a low nitrogen content in the converter.

607,276 TRIGGS, W. W. (Bliss Company, E. W.). Unwinding and feeding metal strip from coils.

607,285-6-7 Soc. D'ELECTRO-CHIMIE, D'ELECTROMETALLURGIE ET DES ACIERIES ELECTRIQUES D'UGINE, and COMPTOIR INDUSTRIEL D'ETIRAGE ET PROFILAGE DE METAUX. Extrusion of metals.

607,350 TRIGGS, W. W. (Bliss Company, E. W.). Strip feed mechanism.

607,385 AMERICAN CYANAMID COMPANY. Concentration of cobalt-nickel ores.

607,404 WRIGHT, W. E., and BALLARD, W. E. Application of metal coatings to metal surfaces.

607,405 ANDERSON, J. Metal cutting and grinding machines.

607,518 HERROD, E. Manufacture of wire.

607,579 STOKES, C., BACKHOUSE, H., BOOTH, C. H., MENSFORTH, T., and STAVES, K. Devices for testing the hardness of metals.

607,588 STONE & COMPANY, LIMITED, J., MURPHY, A. J., and PAYNE, R. J. M. Magnesium alloys.

607,616 GRESHAM, H. E., WHEELER, M. A., and HALL, D. W. Nickel base alloy.

607,654 BALLARD, W. E. Art of metal spraying.

607,658 SLATER & WHEELER, LIMITED, and JONES, W. E. H. Electric brazing.

607,761 BRIDGE & COMPANY, LIMITED, D., and SHAW, W. Casting and extruding of metals.

607,794 HARVEY & COMPANY (LONDON), LIMITED, G. A., and FERGUSSON, H. B. Automatic welding equipment.

607,808 ALLMANNA SVENSKA ELEKTRISKA AKTIEBOLAGET, and SCHAUB, C. Method of heat-treating steels and other metals.

607,870 PEGARD, M. Device indicating the movements executed by metal cutting and like machine-tools.

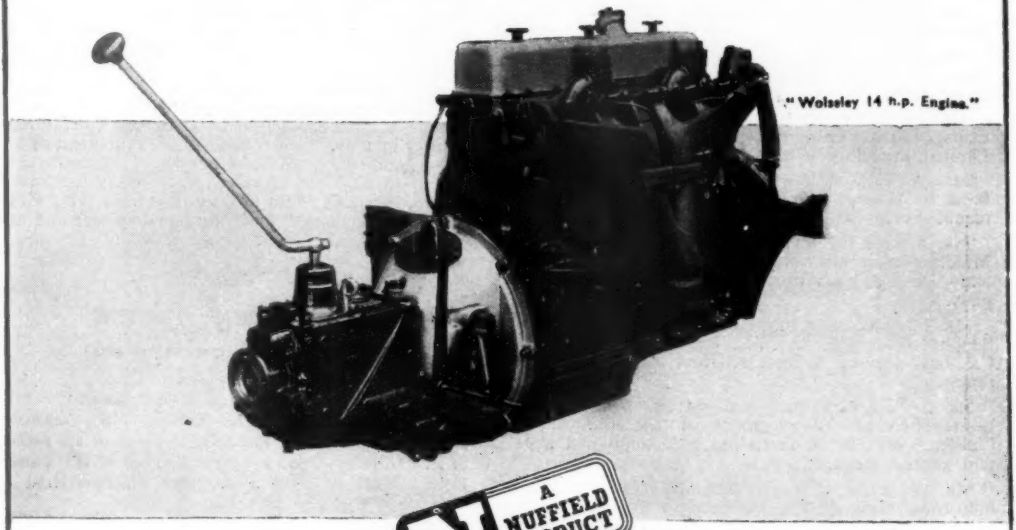
607,881 EHL, R. Method and means for brazing and hardening cutting tools.

607,944 KOLLER, K., and GALOCSY, Z. Process for the reduction of iron ores in the blast furnace.

608,088 SCOTTISH ENAMELLING COMPANY, LIMITED, WATSON, F. A., and SHAW, W. M. A. Manufacture of flanged tubular shells from sheet metal.

608,112 DU PONT DE NEMOURS & COMPANY, E. I. Inhibition of metallic corrosion.

608,232 JACKUET, J. F. A. Continuous casting of ingots.



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Personal

MR. C. F. RUSSELL has resigned from the board of Specialloid, Limited.

MR. A. W. A. DICK-CLELAND has been appointed a director of Lancashire Dynamo & Crypto, Limited, Manchester.

MR. R. W. STOREY has been appointed deputy sales manager of the Brush Electrical Engineering Company, Limited, Loughborough.

MR. W. T. AGAR has been appointed to the board of B. & S. Massey, Limited, steam and power hammer manufacturers, of Manchester.

MR. ROBERT FRANKLAND, commercial manager at the Middlesbrough wireworks of Dorman, Long & Company, Limited, has retired after 50 years with the company.

MR. L. A. WITHAM, manager of the Scottish Foundry Supplies Company, 55, West Regent Street, Glasgow, C.2, has resumed business activities after a prolonged illness.

SIR A. H. ROY FEDDEN has been appointed director of research and development of Leyland Motors, Limited. MR. H. S. FORD has been appointed assistant general manager.

MR. W. SCOTT, managing director of Jarrow Metal Industries, Limited, who has been in ill-health lately, has left England for a combined business and convalescent trip to South Africa.

MR. H. GREGORY, who is to represent Samuel Osborn & Company, Limited, Sheffield, for the sale of steel castings in the Birmingham area and in South Wales, was formerly with David Brown, Limited, Penistone.

MR. OWEN HUGH SMITH and MR. C. L. DALZIEL have resigned from the board of Associated Electrical Industries, Limited. SIR ROBERT RENWICK and MR. M. J. BABBINGTON have been nominated to fill the vacancies.

MR. H. CHAPMAN, who for the past two years has been the general manager of the manufacturing departments of Mann Egerton & Company, Limited, electrical and motor-car engineers, of Norwich, has been appointed to the board of the company.

MR. ERNEST LAWRENCE, of the London office of Dorman, Long & Company, Limited, retired on December 31. Having started from school at the Britannia Works, Middlesbrough, he spent the whole of the 58 years of his business life in the company's service.

MR. HARRY SIMPSON, head foreman joiner of Short Bros., Limited, shipbuilders, of Sunderland, has received a presentation to mark his 50 years' service with the company. Mr. Simpson, who is 64, has held his present position for 26 years and has assisted in the fitting-out of 200 vessels.

MR. R. H. COLLINGHAM has relinquished the position of chief turbine engineer for the British Thomson-Houston Company, Limited, but he will continue his association with the company as consultant on technical design problems. He joined B.T.-H. in the test department in 1905 and was ultimately in charge of the turbine test section and chief assistant to the head of the department. In 1908, he transferred to the turbine engineering department to found the section dealing with exhausters, blowers and compressors, and was responsible for all the original designs of this class of machinery. Later he extended his activities to include all aspects of turbine design, and was appointed chief assistant to the late Mr. F. Samuelson in 1925, and chief turbine engineer in 1939. Consequent on the retirement of Mr. Collingham, MR. K. R. HOPKIRK, assistant chief mechanical engineer, assumes responsibility for turbine and gearing design and engineering, while MR. P. D. MORRIS is appointed chief turbine engineer and MR. S. A. COULING chief gear engineer.

Company News

(Figures for previous year in brackets.)

VENESTA—Dividend of 10% (same).

SILENTBLOC—Interim dividend of 12½% (same).

JOHN SADD & SONS—Interim dividend of 15% (same).

IRISH ALUMINIUM COMPANY—Dividend of 5% (same).

T. M. BIRKETT & SONS—Interim dividend of 7½% (same).

BRECKNELL, MUNRO & ROGERS—Final dividend of 30% (25%), making 45% (40%).

OLIVER PELL CONTROL—No preference dividend will be paid as at December 31, 1948. (Paid to December 31, 1945.)

MARSHALL, SONS & COMPANY—Profit for the year to September 30, 1948, after working expenses and directors' remuneration, £231,905 (£212,801); to taxation, £120,000 (£114,000); depreciation, £25,774 (£21,767); net profit, £86,131 (£77,034); to preference dividend, £9,350 net (£4,491); ordinary dividend of 15% (same); general reserve, £20,000 (same); forward, £76,348 (£77,317).

HILLS PATENT GLAZING COMPANY—Group profit for the 18 months to July 31, 1948, £47,400 (12 months to January 31, 1947, £42,607); to profits tax, £3,000 (£15,109); income tax, £11,385 (£12,104); leaving £33,015 (£15,394); parent company's balance, £32,458 (£15,395); to general reserve, nil (£3,500); preference dividend, £11,344 (£3,025); ordinary dividend of 20% for 18 months on increased capital, £11,000 (20% for 12 months, £5,500)); off development expenditure, £4,000 (nil); forward, £13,058 (£6,944).

JOHN FOWLER & COMPANY (LEEDS)—Trading profit for the nine months to September 30, £54,286 (£7,775 for year 1947); taxation reserve in previous years, no longer required, £12,310; to depreciation, £23,962 (£26,671); auditors' and directors' remuneration, £4,837 (£7,615); loss on disposal of fixed assets, £1,090; profit, £36,707 (loss £22,241,, after crediting £3,000 surplus on realisation of investments); to tax, £2,241 (£2,775); preference dividend, £5,563 (£7,527); preference capital redemption, £3,114 (£3,945); forward, £145,744 (£119,955).

MANN EGERTON & COMPANY—Full report for the year to September 30, 1948, shows:—Consolidated trading profit, £203,806 (£202,948); provisions previous years not required, £6,369 (£7,750); interest on settlement of a war damage claim, £2,930 (nil); interest on Government securities and tax-reserve certificates, £777 (£2,357); to depreciation of fixed assets, £13,959 (£10,020); auditors' remuneration, £905 (£690); deferred repairs of fixed assets, nil (£2,000); supplementary pensions, £2,500 (same); bonus to employees, £4,000 (£8,000); fluctuation in value of investments, nil (£2,500); taxation, £103,500 (£120,270); net profit, £89,018 (£67,075); to fixed assets replacement reserve, £10,000 (nil); stock depreciation reserve, £20,000 (nil); general reserve, £20,000 (£25,000); dividend equalisation reserve, £10,000 (same); dividend of 50% and bonus of 30%, making 80% (dividend of 40% and bonus of 60%), £15,636 (£19,546); forward, £35,229 (£31,105).

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Raw Material Markets

Iron and Steel

The pig-iron position is a little easier, but not because of any increase in output; any improvement is solely due to the holidays and the consequent reduction in consumption. However, users of low- and medium-phosphorus iron are pressing for delivery of their licensed tonnages and both hematite and common foundry iron remain in short supply. Another furnace is to be lighted up to increase the output of high-phosphorus iron, but it will be some time before this increase in output makes much impression as stocks are very low and deliveries are in arrear.

Deliveries of steel semis—the raw material of the re-rolling industry—are on a better scale, but they still fail to satisfy full requirements. New billet mills are being built and will ultimately reduce dependence on supplies from overseas. But even when the four-year development plan is complete the need for imports of foreign semis is envisaged, and the present scale of these imports, though improving, does not wholly suffice for current needs. The heavier types of material such as blooms and slabs are reasonably abundant, but sheet bars and small billets are wanted.

For almost every description of finished steel there is an overwhelming demand, but by far the heaviest pressure is in the sheet trade. Buyers from all over the world are seeking supplies. There are numerous inquiries even from U.S.A. and Canada, and buyers will pay almost any price for reasonably early delivery. Plate mills, too, have very heavy commitments, and maximum outputs for the first half of 1949 are already accounted for. For heavy joists and sections the call is less urgent than for the smaller sizes, but substantial orders are in hand for light and heavy steel rails both for home use and for export. Colliery requisitions have certainly not declined and wire drawers are unable to satisfy the full demand owing to the shortage of wire rods.

Non-ferrous Metals

The November copper statistics, published by the British Bureau of Non-ferrous Metal Statistics, show that, for the month, copper consumption in the United Kingdom amounted to 43,631 tons, of which 30,641 tons were in the form of virgin and 12,776 tons secondary. For October, too, total deliveries were 43,417 tons, so that there was little or no difference between the two months; usage of virgin copper in November, however, declined to 29,530 tons, while secondary metal increased to 14,101 tons. Last year, therefore, looks like finishing in good style, for December, in spite of the interference of the Christmas holidays, was probably quite a good month. The Bureau also announces a welcome increase in stocks of lead, from 13,569 tons at October 31 to 21,403 tons at the end of November. Even so, reserves of this metal are not by any means adequate and there is an urgent need to build up stocks to at least three months' cover. True, the exorbitant price now charged for lead is having an adverse effect on demand, for substitutes are rapidly appearing in all cases where it is possible to employ alternative substances, but, nevertheless, it is essential that adequate stocks of this metal should be held. Probably the quantity of secondary pig-lead and scrap on hand is high, but perhaps not so high as it was, for since the price of virgin lead reached £90 per ton, there has been a tendency for holders of scrap metal to liquidate their holdings.

There is no change to report in the price of virgin aluminium, which remains at £87 per ton, and in some quarters the opinion is gaining ground that stability at the present level will be maintained, at any rate, until the middle of this year. There is no further development in the controversy over alleged shipments of scrap aluminium from the U.K. to the United States, but in any case this is a matter which must be handled at Government level. There are reports of a plan to effect a regulation scheme in tin, under which production and consumption quotas would be fixed for five years. It was recently stated that 1948 saw a 50-per-cent. increase in tin exports from Malaya, and there is little doubt that the overall output of this metal during the present year will be on an ever-increasing scale. This is understandable in view of the prevailing price level, but it is equally understandable that users will make intensive efforts to by-pass the metal in favour of substitutes. Already the inflated price level is having its effect and some Continental countries are reported as not taking up their full quotas. But for stockpiling there would have been a setback in the tin price some time ago.

New Companies

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

HOLLOWAY METAL ROOFS—£20,000. F. R. Burber, 18, Austin Friars, London, E.C.3, subscriber.

REES INDUSTRIES, Great Western Dock, Llanelly—Shipbreakers, etc. £25,000. E. G. and W. Rees.

LLOYDS ENGINEERING COMPANIES, 6, Southampton Place, London, W.C.1—£30,000. F. L. Kessel and A. G. A. Rainey.

GRANTHAM IRONWORKS COMPANY, Queen Street, Grantham, Lincs—£20,000. N. F. Goffer, A. C. Lynch, and A. V. Boothroyd.

HUBERT H. P. TRIST & COMPANY—Manufacturers of brakes, brake blocks, forgings, castings, etc. £100,000. R. C. Howley, 17, Throgmorton Avenue, London, E.C.2, subscriber.

PORTWAY FORGINGS (WEDNESBURY), Portway Works, New Street, Wednesbury, Staffs—Upset and drop forgers and stampers, etc. £30,000. J., M. and J. D. Norton and M. I. Page.

THOMAS SQUIRE & COMPANY, Wolverhampton Road, Wednesfield—Iron, steel and metal stockholders, fabricators, etc. £30,000. E. Sellman, A. and C. T. Squire and A. L. Blower.

THE GRAHAMSTON IRON COMPANY, LIMITED, Falkirk, is to erect a building containing washing and sanitary facilities for its employees at an estimated cost of £7,705.